THE ANNALS

AND

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[THIRD SERIES.]

> " .... per litora spargite muscum,
> Naiades, et circùm vitreos considite fontes :
> Pollice virgineo teneros hìc carpite flores :
> Floribus et pictum, divæ, replete canistrum.
> At vos, o Nymphæ Craterides, ite sub undas ;
> Ite, recurvato variata corallia trunco
> Vellite muscosis e rupibus, et mihi conchas
> Ferte, Deæ pelagi, et pingui conchylia succo."
> *N. Parthenii Giannettasii* Ecl. 1.

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I.—*Descriptions of new Genera and Species of Diatoms from Hongkong.* By R. K. Greville, LL.D., F.R.S.E. &c.

[Plate V.]

Palmeria, nov. gen., Grev.

Frustules free, hemispherical, having an axis on the plane, and longitudinal lines, indicative of fissiparous division, on the convex surface; structure an exceedingly minute hexagonal cellulation, appearing (except under a high magnifying power) like a fine close moniliform striation, radiating from a subcentral nucleus to the margin of the valve, along with a more distant series of fine costæ terminating in intramarginal punctiform nodules.

This very singular Diatom cannot be satisfactorily referred to any of the families defined in the most recent general arrangement—that of Mr. Ralfs in the last edition (1861) of Pritchard's 'History of Infusoria.' With two of them, however (the *Cymbelleæ* and the *Coscinodisceæ*), there appear to be some points in common. The form of the valve agrees with the first of these families, and the frustule, as in *Amphora*, presents a ventral and a dorsal aspect; but there are no transverse striæ, no longitudinal line, no nodules. With regard to the second family named, it is excluded at once by the absence of the requisite disciform structure and intermediate ring-like zone. Nevertheless the minute organization is very similar; for we have an hexagonal cellulation radiating from a centre, along with a series of other sharply defined lines, which may be called radiating costæ, and which terminate in submarginal nodules—the analogues of the lines and minute spines in *Coscinodiscus concinnus* of Smith. But our new Diatom seems, at first sight, to have a closer affinity with Dr. Wallich's curious genus *Hemidiscus*, which at present is placed (I fear erroneously) among the *Anguliferea*. The arcuate form, radiating cellulation, and submarginal puncta certainly show an approximation between the two. Whatever view, however, may be taken of their family relations, there are differences which must keep them apart as genera—the chief of which is the nodule on the ventral margin of *Hemidiscus*. The submarginal puncta in that genus are also very different from the minute nodules which terminate the radiating costæ in *Palmeria*; and it is not unworthy of notice that the point of radiation in the latter genus is never *exactly* centrical, being invariably somewhat to the ventral side of the centre; whereas in *Hemidiscus* it is truly centrical.

In a popular view, the frustule of *Palmeria* is graphically compared by its discoverer to the half of a peeled orange, the lines on the convex surface representing the segments of that fruit.

In the living state, the endochrome is collected into minute roundish masses, which dot the whole of the interior of the siliceous covering. The nucleus in the valve is then very conspicuous; and I have a sketch, from Mr. Palmer, showing radiating "reticulated cords," similar to those described and figured by Professor Max Schultze in *Coscinodiscus centralis* and his *Denticella regia* (Mic. Journ. vol. vii. p. 13, pl. 2. figs. 11–13). This appearance has also been observed, even in this country, in specimens received from China, both of *Palmeria* and of a species of *Coscinodiscus*, by my friend Mr. Laurence Hardman. The peculiar current-like motions described by Prof. Max Schultze have been witnessed likewise to some extent by Mr. Palmer, especially the formation of a more compact mass of active particles, changing both its shape and position within the cell from time to time. (Letter, June 1864.)

Palmeria Hardmaniana, n. sp., Grev. Pl. V. figs. 1–4.

Hab. Hongkong Harbour; John Linton Palmer, Esq., Surgeon R.N., 1863.

A very large Diatom (varying, however, greatly in size), some examples being as much as ·0160″ and upwards in diameter.

Frustules nearly, but not fully, hemispherical previous to self-division; on one side plane, with an axis through the middle and a valve on each side; on the convex surface marked with a middle longitudinal line and two fainter ones, indicating the direction of future fissiparous division. The valves lunate, with a straight ventral margin and obtuse ends; the surface covered with very fine lines of hexagonal cellulation, radiating from a blank nucleus or roundish vacant space, not situated exactly in the centre, but a little towards the ventral side. Radiating from the same point, and at more remote intervals, are also exceedingly fine, but stronger, lines or delicate costæ, which terminate in a continuous row of punctiform nodules a little within the margin of the whole circumference.

The first gatherings of Diatoms in Hongkong Harbour, sent me by Mr. Palmer, contained some imperfect frustules of this Diatom, which, along with his notes and sketches, greatly stimulated my desire for more perfect materials. Fortunately my friend Mr. L. Hardman had also received some collections from the same locality; and, as they were rich in this production, he, at my request, most kindly instituted a careful and minute examination into its structure; and it is only due to his friendly aid and unrivalled manipulation to state that it is mainly from his notes, sketches, and specimens that my drawings and descriptions were prepared. My valued correspondent Mr. Palmer subsequently forwarded a cell filled with frustules, preserved in fluid, along with additional interesting information confirming the results at which both Mr. Hardman and myself had arrived. It is with sincere pleasure that I unite with the name of the discoverer, now so worthily bestowed on the genus, that of the gentleman who so materially aided me in the investigation of its structure.

Palmeria Hardmaniana is a very delicate and fragile Diatom, readily dividing (if arrived at the proper stage) at the slightest touch—falling asunder as the segments of an orange are separated, to use a simile already referred to. In size the frustules appear to have a great range. Mr. Hardman has observed some, however, which seem to belong to a second species, only half the average size of the one now described, and much stronger and thicker. As far as I can judge from a specimen he has kindly given me, I am disposed to agree with him; but it will be well to examine a larger series of examples before coming to a positive conclusion. Mr. Palmer informs me that he also has observed frustules of a much smaller size; but, in the absence of details, it is impossible to say whether they belong to the supposed new species or not.

Genus ASTERIONELLA.

Asterionella Synedræformis, n. sp., Grev. Pl. V. figs. 5, 6.

Frustules exactly linear throughout, truncate, with two minute apiculi at the apex; valve slightly dilated and rounded at the base.

Hab. Hongkong Harbour; J. L. Palmer, Esq.

A very fine and distinct species, agreeing only with *A. Ralfsii* in the frustules being exactly linear; but the latter is a freshwater species, having, besides, the valve of a different shape. The present species is a large one, the frustules being sometimes ·0080″ and upwards in length. Towards the apex the margins appear to be thickened, and terminate in two minute apiculi. The valve is transversely striated, shortly acuminated at the apex, becoming more slender below (as in other species), and then slightly dilated at the base. The late Prof. Smith committed an oversight in resting the character of the genus partly upon the frustules being "inflated towards one or both extremities;" for he defines one of his own three species (*A. Ralfsii*) as "on F. V. exactly linear," which they are. This is of little consequence, as the main character depends upon the stellate arrangement of the frustules, combined with the form of the valve, which is different at the two extremities. Our new species appears to be abundant at Hongkong. I have one specimen in my cabinet in which only two frustules are absent from a circle of fourteen.

Genus SURIRELLA.

Surirella Palmeriana, n. sp., Grev. Pl. V. fig. 7.

Valve ovate-oblong, with obtuse ends; alæ inconspicuous; costæ very slender, numerous, regular, terminating in a narrow median line, and having very delicate intermediate striæ.

Hab. Hongkong Harbour; in material communicated by J. L. Palmer, Esq.

A very fine species, allied to *S. gemma*, but differing in important particulars, especially in the total absence of alæ, and in the canaliculi being equally distant. It is, besides, a much larger species. Prof. Smith gives the length of *S. gemma* at from ·0025″ to ·0058″; that of *S. Palmeriana* is ·0080″. The canaliculi are 4 in ·001″, and the intervening spaces are beautifully arched or crenate at the margin. It appears to be exceedingly rare, as Mr. Palmer has not referred to it in his letters.

Genus CRESWELLIA.

Creswellia annulata, n. sp., Grev. Pl. V. fig. 8.

Minute; frustules short, cylindrical, truncate, transversely striated so as to appear annulate; connecting processes very numerous, very short, linear, obtuse.

Hab. Hongkong Harbour; in material communicated by J. L. Palmer, Esq.

A fragile little species, seldom found quite entire, and generally in solitary frustules; but I have repeatedly seen two in connexion, and have at the present moment a chain of three under my eye. I have not been able to perceive any cellulation; but the annulate character is very obvious. The length of the frustule is about ·0010″; the breadth a little less.

I take the present opportunity of mentioning that in specimens burnt on the cover, and mounted dry, I have observed indications of an annulate structure in *C. cylindracea*, to which our new species appears to be allied.

Genus Hemiaulus.

Hemiaulus chinensis, n. sp., Grev. Pl. V. fig. 9.

Frustules rectangular, very minutely punctate; the angles produced into linear-attenuated horns, tipped with a spine; space between the horns nearly straight.

Hab. Hongkong Harbour; J. L. Palmer, Esq.

Like *Hemiaulus Polycystinorum* and others of the genus, the present Diatom is most inconstant in point of size, not so much in the length as in the breadth of the frustules. I have them from ·0007″ to ·0030″. It is a delicate and transparent species, and liable to be overlooked, unless burnt on the cover previous to mounting. At the sutural line the puncta are exceedingly minute, and gradually increase in size to the surface of the valve included between the horns. I am not acquainted with any true species of *Hemiaulus* in which the punctation is so minute. The horns are somewhat truncate, and furnished with a terminal, slender, short spine.

In his memorandum sketch, Mr. Palmer has represented the valve, a view of which I have not been so fortunate as to obtain.

Genus Amphiprora.

Amphiprora lepida, n. sp., Grev. Pl. V. fig. 10.

Front view broadly linear, elongated, rounded at the ends, very slightly constricted in the middle, and with a marginal row of very minute puncta; middle portion grooved with straight longitudinal lines.

Hab. Hongkong Harbour; in material transmitted by Mr. J. L. Palmer.

Well characterized by its narrow form, almost straight margins, and ribbed appearance of the connecting zone. I cannot perceive any trace of striæ or of supplementary wings. The length of the frustule is ·0065″; breadth in the middle ·0010″.

Amphiprora hyalina, n. sp., Grev. Pl. V. fig. 11.

Hyaline; front view divided, by a deep and sharp constriction, into two roundish lobes, with a row of extremely minute marginal puncta, and a second inner row of irregular ones; supplementary wings forming a single curve; connecting zone with longitudinal lines.

Hab. Hongkong Harbour; in material communicated by J. L. Palmer, Esq.

I offer this species with some little apprehension that it may turn out to be an extraordinary variety or condition of *A. alata*. Assuredly it appears to have absolutely nothing in common with the figures given by Prof. Smith in his 'Synopsis of the British Diatomaceæ;' but it more nearly resembles Kützing's figures in his 'Bacillarien,' which, although not quoted in Pritchard's 'Infusoria,' are copied in the plates. These figures, however, are somewhat confused, and, being deficient in details, cannot be regarded as definitive. There is, if I may be allowed the expression, a great difference in the physiognomy of the Chinese Diatom. The supplementary wings also, which sweep down and intersect the lines of constriction, constitute an important character. I have been unable to observe whether the wing be continued round the ends, as is said to be the case in *A. alata*. The marginal puncta are much more minute than in that species; and I cannot make out any striæ. Length ·0028″, breadth ·0018″.

Amphiprora venusta, n. sp., Grev. Pl. V. fig. 12.

Front view broadly panduriform, truncate at the ends; wings widely rounded at the corners, and then rapidly constricted; supplementary wings narrow, passing in a single curve within the nodule, striated; margin strong, with a row of minute puncta.

Hab. Hongkong Harbour; in material communicated by J. L. Palmer, Esq.

This species possesses a considerable likeness to *A. alata* (Edin. New. Phil. Journ. vol. xviii. pl. 1. fig. 13), but differs in its strong margin, in the row of marginal puncta, and in the apparent absence of striæ in the wings. In general outline it is also very similar to *A. Meneghiniana* and *A. Brébissoniana* (*loc. cit.* pl. 4. figs. 7, 8); but here the single curve of the supplementary wings, besides other characters, removes it at once. In the dry mounted slide the margin appears of a fine blue colour. Length of frustule ·0040″.

Amphiprora chinensis, n. sp., Grev. Pl. V. fig. 13.

Front view transversely striated, oblong, rounded at the ends, moderately constricted at the middle; wings flatly convex; supplementary wings narrow, with a marginal row of dark points; connecting zone with a few narrow, ridge-like lines; striæ minutely moniliform.

Hab. Hongkong Harbour; in material communicated by J. L. Palmer, Esq.

The frustules are sometimes twisted so as to throw a portion of the wings out of focus; and the disposition to twist seems almost always to cause more or less undulation in the rib-like lines of the middle portion. The whole surface is transversely striated, and the striæ of the wings are clearly, although extremely minutely, moniliform. The flatness of the wing-curves gives a degree of parallelism to the general outline, which is very characteristic. The supplementary wings follow the curve of the primary ones in a somewhat less degree, and pass down within the nodules, having the appearance of an elevated ridge, the ridge-line marked with a row of minute dark spots (scarcely puncta), caused possibly by the intersection of the striæ. Length of frustule ·0040″ and upwards.

EXPLANATION OF PLATE V.

Fig. 1. Frustule of *Palmeria Hardmaniana*: front view, magnified 100 diams., showing the lines of future fissiparous division.
Fig. 2. The same, showing the valves.
Fig. 3. The same, showing the valves and frustule in the process of division.
Fig. 4. Valve of the same, showing the radiating structure, magnified 150 diams.
Fig. 5. *Asterionella Synedræformis,* exhibiting two of the frustules and the bases of others *in situ.*
Fig. 6. Valve of the same.
Fig. 7. *Surirella Palmeriana.*
Fig. 8. *Cresswellia annulata*: two frustules *in situ,* the valves of one of them separating.
Fig. 9. *Hemiaulus chinensis*: two frustules *in situ.*
Fig. 10. *Amphiprora lepida.*
Fig. 11. ,, *hyalina.*
Fig. 12. ,, *venusta.*
Fig. 13. ,, *chinensis.*

[All the figures are magnified 400 diameters, except figs. 1 to 3, which are magnified 100, and fig. 4, which is magnified 150 diameters.]